Darwinism, Creative Evolution, and Popular Narratives of 'Life's Splendid Drama'

2009 has been the bicentenary of Charles Darwin's birth, and the 150th anniversary of the publication of 'On the Origin of Species'. On 29-30 June, the British Academy, the Royal Society, and the American Philosophical Society held a joint conference in Cambridge to celebrate. One of the participants, **Professor Peter Bowler FBA**, *here discusses the extent to which early accounts of evolution portrayed it as one big adventure story.*

IN HER *Darwin's Plots*, Gillian Beer explored the role played by by narratives linked to evolutionary themes in 19th-century literature. Many people have looked to stories about the key steps in evolution as one way of reading a deeper meaning into the process – episodes in what the palaeontologist William Diller Matthew called 'Life's Splendid Drama'. Misia Landau's *Narratives of Human Evolution* (1990) sparked controversy by claiming that many theories of how humans emerged had the same structure as adventure stories in which the hero (our ancestor) underwent trials to demonstrate his ability to conquer a new world and was rewarded with the prize of a big brain. This claim was deeply disturbing for modern paleoanthropologists, who thought they would seem unscientific if they were found to be only 'telling stories'. But postulating 'adaptive scenarios' to explain particular steps in evolution is standard practice within the modern Darwinian paradigm, and one can tell stories about every episode in the drama, not just the final emergence of humankind.

There is another way of reading a wider purpose into evolutionism, which is to suppose that the mechanism of evolution itself is directed toward the production of higher types. Darwin's theory of natural selection isn't very appropriate here, because it's hard to read a moral direction into a process of trial and error driven by struggle and local adaptation. The preference of many 19th-century thinkers for a model of directed evolution accounts for much of the effort devoted to creating alternatives to natural selection during what Julian Huxley later called the 'eclipse of Darwinism'. To work at this level, evolution had to generate inevitable progress, or at least predictable developmental trends. But such theories do not offer a suitable framework within which to construct narratives – it's hard to tell an interesting story about a process whose outcome is obvious from the very beginning. Landau's analysis worked well for Darwin himself: *The Descent of Man* does indeed tell a story in which our ancestors adventured out onto the open plains and were rewarded with tools and bigger brains. But her efforts to see a narrative structure in other early theories of human origins were less convincing.

Some evolution theories provide an open-ended framework within which one can tell adventure stories, while others generate meaning through their own law-like structure. In this article, I try to identify the key features which permit the creation of narratives, and draw on my own recent work on popular science to argue that, in the sort of literature widely available to the general public, this mode of discourse about evolution only became widespread in the early 20th century. Given the prevalence of non-Darwinian theories based on rigid trends during the 'eclipse of Darwinism', I argue that the role of narrative was actually quite limited in descriptions of evolution up to that point. Various factors account for the eventual appearance of adventure stories in the popular science literature, including, somewhat paradoxically, the general enthusiasm for Henri Bergson's ostensibly anti-Darwinian philosophy of 'creative evolution'.

The unpredictability of evolution

It is far more difficult to create meaningful narratives about particular episodes if the evolutionary process itself is supposed to be governed by built-in trends aimed in a particular direction. Even if the end-product is a meaningful goal, it's that goal which creates the meaning – each event in the sequence is just one more entirely predictable step toward it. To make the kind of narrative that Landau was talking about, there has to be an element of unpredictability or open-endedness about evolution. Other outcomes must be possible, at least at some critical points in the process. With this degree of freedom, one can hope to tell a story about why one particular direction worked while others led to failure.

This level of open-endedness is provided most obviously by theories which present evolution largely as a process by which species adapt to changes in their local environment, especially when those changes are brought about by unpredictable opportunities opened up by geological and geographical change. Darwin's theory certainly fits the bill, as in his account of the early hominids modifying their posture as they began to move out onto the African plains, while their cousins, the apes, remained in the forests. Underlying this open-endedness was Darwin's insistence that individual variation is essentially undirected, and hence cannot by itself shape the course of evolution. Natural selection is opportunistic and its results are thus often unpredictable, especially in a world of ever-changing environments and habitats.

Herbert Spencer and Lamarckism

Any theory which supposes that adaptation to the local environment is the main driving force of evolution will have similar implications. This is certainly true for the Lamarckian theory of the inheritance of acquired characteristics, an alternative that became widely popular in the later decades of the 19th century. Lamarckism was favoured by the philosopher Herbert Spencer, who saw the struggle for existence as the driving force which encouraged individuals to improve themselves when challenged, on the assumption that these improvements would be transmitted to their offspring. There is not much narrative in Spencer's accounts of evolutionary progress – if anyone typifies the 19th-century's passion for explanations based on natural law it is he.

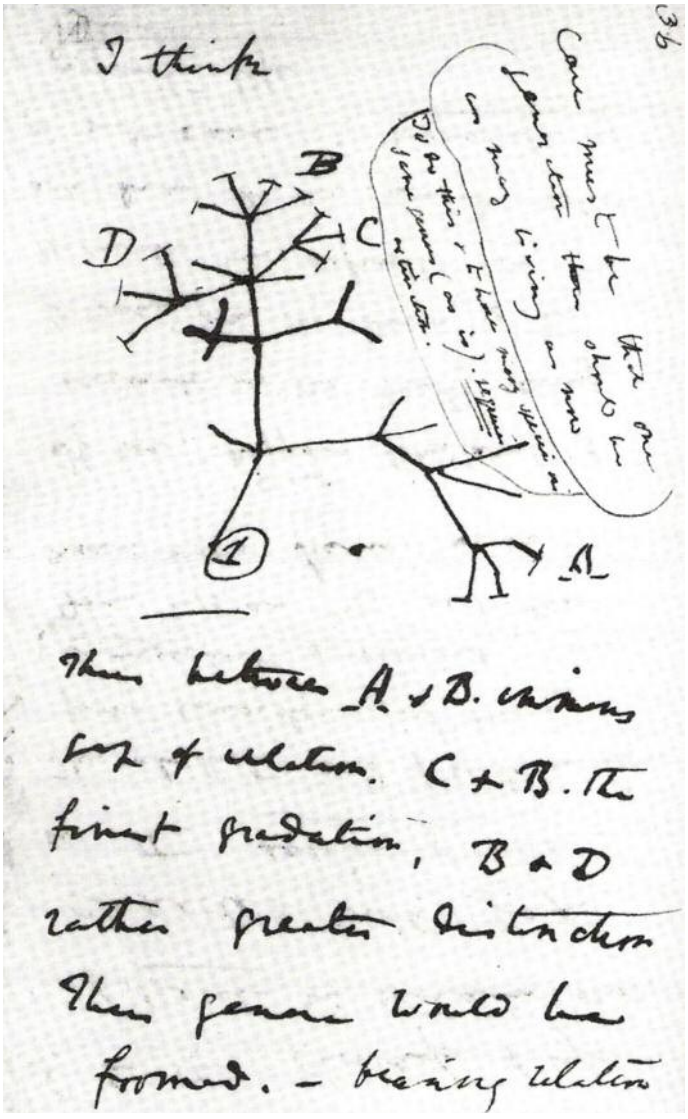


Figure 1. *A page from Charles Darwin's notebooks around July 1837 showing his first sketch of an evolutionary tree. It illustrates that evolution was undirected.* © *Syndics of Cambridge University Library.*

But a very similar model of evolution lies at the heart of Charles Kingsley's evolutionism, and *The Water Babies* offers one of the earliest attempts to popularise the idea of evolution by turning it into a story of success and failure. Here individuals, like species, are offered a choice of whether to respond actively to the world around them, and progress to higher levels, or to take the lazy way out and degenerate. This may look like Darwinian natural selection, but it is in fact Lamarckism because it depends on individual self-improvement. Kingsley's narrative is effective because it stresses the choices faced by Tom, the water baby, and the evolutionary models he is offered. Spencer did not like to think in those terms, and his more necessitarian vision of Lamarckism dominated the early phases of the Darwinian revolution.

Spencer doesn't use narrative because he wasn't looking for crucial turning points in evolution – for him it was all the working out of inexorable laws. Darwin too wanted the rule of law, but the fact that he could tell a story about our ancestors venturing out onto the plains shows that he was more attuned to the unpredictability of evolution. But Darwin was unusual in this respect. If one looks at the literature, including the popular scientific literature, of his time, Spencer's more necessitarian vision of evolution seems to dominate (whatever uses the literary figures were making of the theory). The popular 'evolutionary epics' of the late Victorian period were epic in their indication of the grand sweep of life's development, but they seldom tell adventure stories about individual episodes in the advance.

The beginnings of the adventure story

To determine when the style of the adventure story did emerge in popular evolutionary texts, I decided to look at a less complex example: the emergence of the amphibians as the first vertebrates adapted to dry land. By the 1920s it was becoming commonplace to describe this as a great adventure, in which innovative creatures took up the challenge of invading or conquering a new environment by inventing a whole series of new functions and structures. But we find no such language in the popular texts of the late 19th century. It doesn't occur, for instance, in the translations of Ernst Haeckel's best-selling *History of Creation* (1876) and *The Evolution of Man* (1879). Popular writers like Grant Allen, Edward Clodd and Joseph McCabe, heavily under the spell of Haeckel or Spencer, saw evolution as an inevitable progress, not as a series of occasional dramatic innovations.

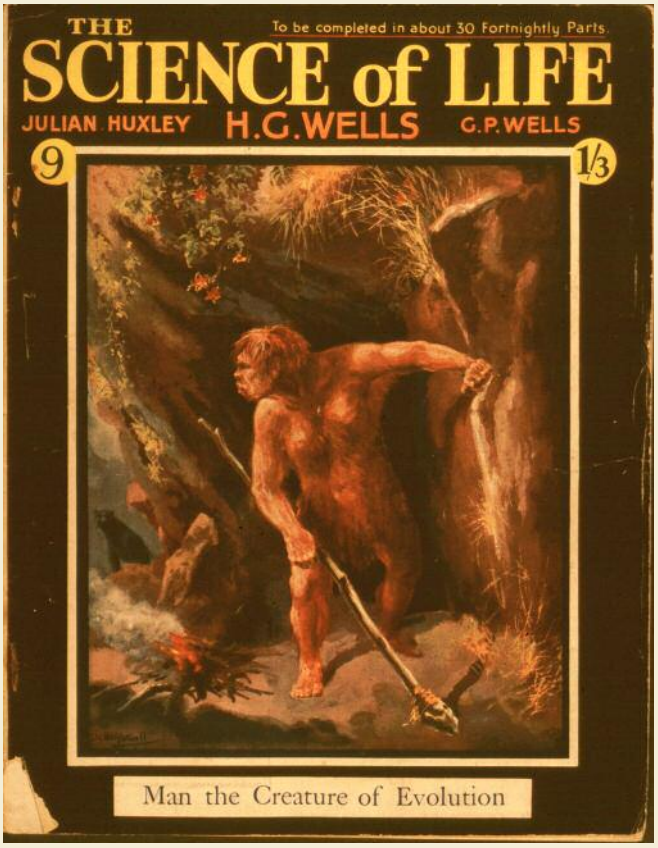
Several developments paved the way for the narrative style of explanation to emerge in the early 20th century. One was the flourishing of research into evolutionary biogeography which followed the publication of Alfred Russel Wallace's *Geographical Distribution of Animals* in 1876. Even Wallace, who was no imperialist, used the language of conquest and colonisation to describe the expansion of successful types into new territories, and such language had become commonplace by 1900.

Another factor was the growing fascination with evolutionary degeneration. Although implicit in Kingsley's *Water Babies*, this did not become fashionable in scientific circles until the publication of E. Ray Lankester's book of 1880. Lankester subsequently became a great friend of H.G. Wells, and it is Lankester's Darwinian take on degeneration that is reflected in the future depicted in *The Time Machine*.

A third important point was the growing recognition by geologists that the geological uniformitarianism which had inspired Darwin was wrong: there *had* been great episodes of relatively abrupt geological change, producing mass extinctions and the sudden opening-up of opportunities for the survivors.

Bergson's creative *élan*

But the most important change which took place in the decades around 1900 was a growing willingness to see the progress of life as an experimental and hence somewhat haphazard process, dependent on occasional unpredictable successes gained by species forced to innovate in the face of environmental challenge. In science, at least,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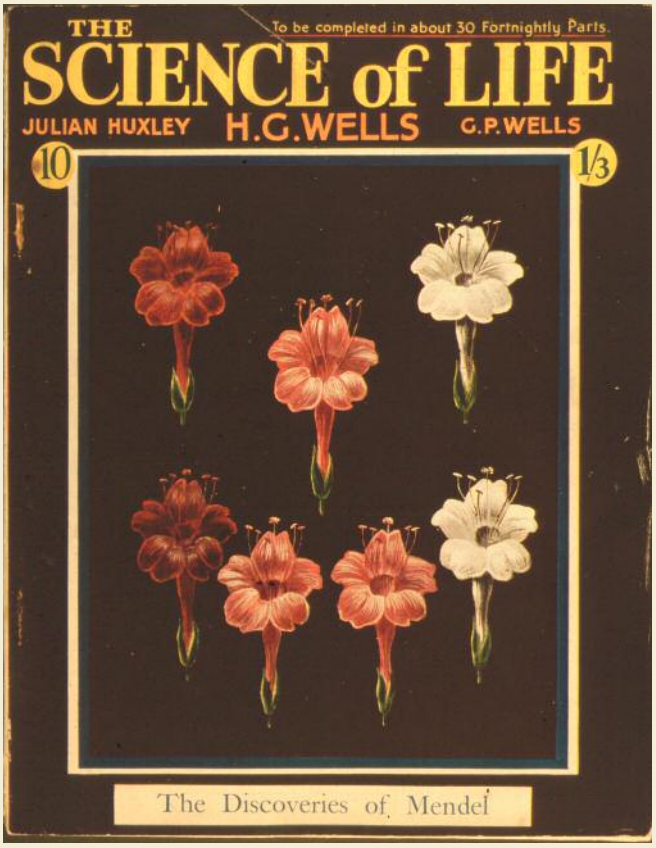
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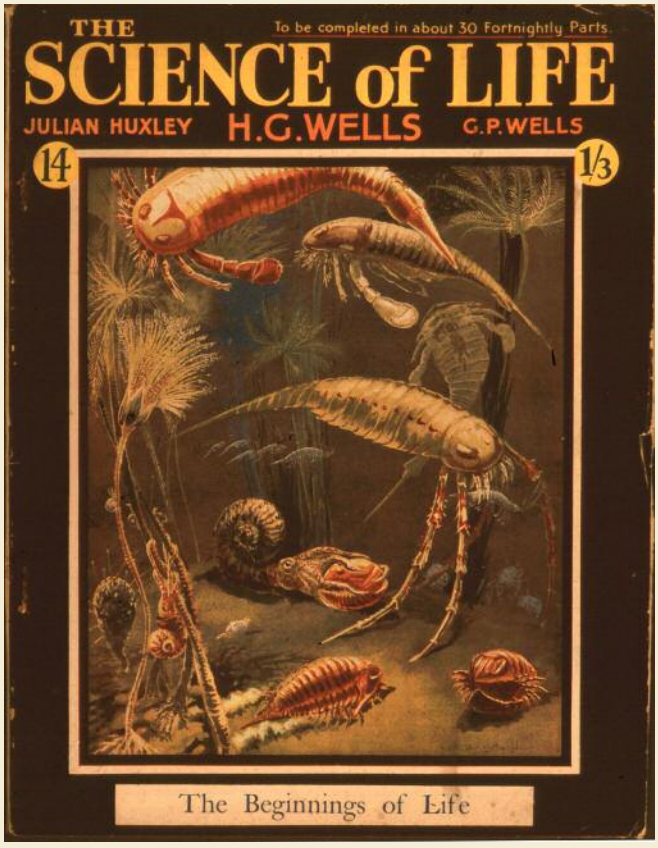
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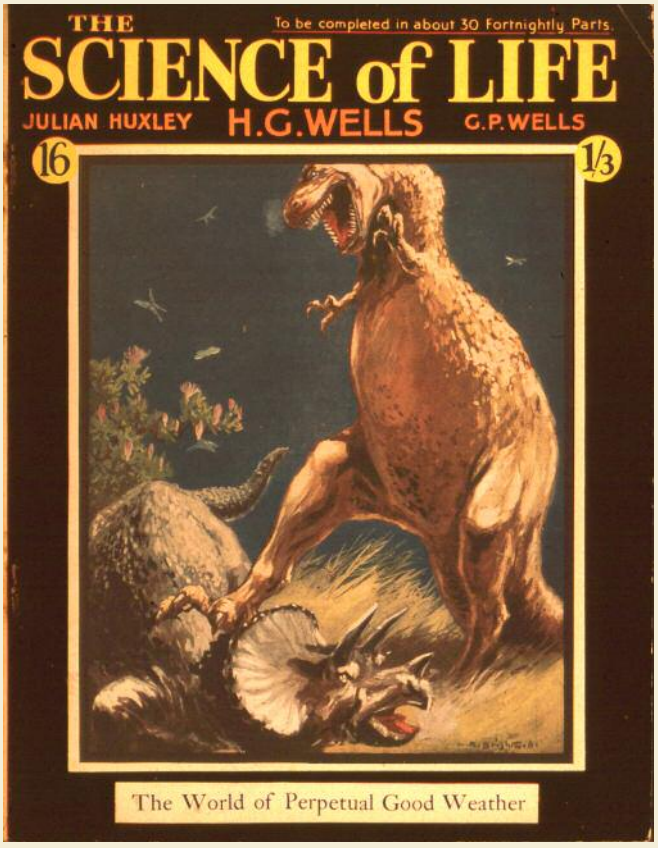
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The World of Perpetual Good Weather

Figure 2. *Published fortnightly in 1929–30,* 'The Science of Life', *by Julian Huxley, H.G. Wells, and his son G.P. Wells, featured episodes from evolution. Images: Dr Peter Broks.*

this way of thinking seems to have flourished in response to the publication of Henri Bergson's *Creative Evolution*, translated into English in 1911. Bergson's vision of the creative *élan vital* struggling to overcome the limitations of matter resonated with a whole generation of biologists. This included figures sympathetic to the spirit if not the letter of Lamarckism, including the Aberdeen biologist and prolific popular science writer J. Arthur Thomson. But it also included some of the new generation of Darwinians, including another great populariser, Julian Huxley. Bergson was explicitly writing against Darwinism, but what he meant by the term was the progressionism of Haeckel and Spencer. As Darwin himself had shown, one can see natural selection as opportunistic and innovative, and this was how Huxley now began to understand it. To get a moral from the process, you have to exploit the element of open endedness and tell inspiring stories about particular innovations.

This is precisely what the next generation of biologists proceeded to do in their popular writings. The *Popular Science* series issued by Lord Northcliffe's Amalgamated Press in 1911-13 uses explicitly Bergsonian language to describe the advance of life as an experimental process, but also brings in a Darwinian element by stressing nature's indifference to those who lose out in the race to innovate. J. Arthur Thomson's *New Natural History* of 1926, talks of the 'invasion of the land' by the amphibians and the 'conquest of the air' by the birds. Thomson (who always wrote effectively about animal behaviour) even stressed the innovative mental powers of modern amphibians to suggest that their distant ancestors had the capacity to press ahead into the new environment. The same language occurs throughout his popular writings, including a book suggesting the moral lessons to be learnt from *The Gospel of Evolution*.

H.G. Wells' *Outline of History* of 1921 has introductory chapters on evolution, written in collaboration with Lankester, which stress the episodic nature of evolutionary innovation following mass extinctions. Here again we have the terminology of the 'invasion of the dry land' coupled with the somewhat less aggressive metaphor of a 'liberation' from the water. In *The Science of Life*, which Wells wrote in collaboration with Julian Huxley later in the decade, there is a whole chapter entitled 'Life Conquers the Dry Land', telling the story of how the amphibians responded to the challenge of a world cursed by drought. There is again a stress on the episodic nature of the great advances in life, all of which arose through response to challenges imposed by geological disturbances.

The use of this kind of dramatic language to describe key episodes in the progress of life represented something quite new in popular descriptions of Darwinism. Unlike most evolutionary epics from the 19th century, it implies that the course of development was not predetermined or predictable, but was contingent on responses to dramatic external challenges. It represents the true flowering of the style of evolutionary narrative used by Kingsley but largely ignored by contemporaries obsessed with the image of inevitable, law-like progress.

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